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THE STUDY OF EXPERIMENTAL PEDAGOGY IN GERMANY

THIRD ARTICLE

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Modern investigations concerning psychic energy and fatigue led us in our last article to condemn the excessive concentration of instruction into the morning hours; instead, the afternoon hours 4:00 to 6:00 or 5:00 to 7:00 were to be secured for instruction.

But it appeared that this rearrangement did not in itself guarantee the welfare of the scholar. The problem of home work presented itself. What hours would remain to the scholar in which to do his work if such a long period of recreation separates the instruction of the morning from that of the afternoon, and the latter is brought so close to the evening? Here a dilemma presents itself, but at the same time we may discover the true point of view from which to solve it. That the scholar have enough recreation is a hygienic necessity. Is it also, we ask, a didactic necessity that he prepare work at home? One circumstance seems to point in that direction. In all subjects there is a great deal of material which the scholar can make his own only by mechanical memorizing. He must learn vocabularies in the languages, dates in historical subjects. He must in the same way master many statistical, geographical, biological, mineralogical, chemical, and physical facts in the geographical and natural sciences. No merely general survey of these facts,

no naming and mentioning on the part of the teacher (however often it is done), no cursory reading and re-reading of an incidental nature, can take the place of the mechanical impress.¹ The latter is necessary in order to lead the scholar to present knowledge in those lines in which he has previously exercised his understanding. It is not practicable to introduce this mechanical work into the lesson hour. That would fritter it irreparably away. Enough if the teacher in all subjects of instruction opens up and strengthens the understanding of the scholar, awakes his interest, and arouses his self-activity. The hour of instruction, at least in the middle and higher classes, ought not to be burdened with the mastering of the material that must be committed to memory. Home work appears then to be the only way left.

Should not the home work show besides how far the scholar, acting independently, can reproduce and utilize the material which has been previously gone over in the class? And so he is overwhelmed with compositions, translations, problems in geometrical construction, algebraic examples, drawings of geographical maps, and like exercises. These exercises are to spur him on to show his own industry, and to give him an opportunity to add to his knowledge and understanding the power to do.

Under the shelter of such considerations, teachers until a short time ago, dragged together from all sides material for memorizing and for practice, to load it upon the pupil for his out-of-school hours, and many still keep up the process. The scholars themselves are, of course, not even consulted; others think and act for them. If the making of the school regulations were in their hands, the result would be quite different. If it were the question of an expenditure of time and strength on the part of the aforesaid overzealous pedagogues themselves, if, after six hours of instruction in school they were expected to endure the constraint of several hours of work at home, they

¹ We shall come back to this important point in a later paper. See concerning it Meumann, *Zur Oekonomie und Technik des Lernens*, p. 29; Ebert and Meumann, *Ueber einige Grundfragen der Psychologie der Uebungsökonomie*, p. 206.

would indignantly protest—especially if the work compelled the body to be still when it was craving for movement, but on the other hand forced the mind, all tired and out of breath from its pace, to mount again and again the scientific steed, instead of straying at will in favorite haunts of fancy and sentiment. The adult refuses to play the rôle of an ever-willing machine. It is assumed off-hand to suit the weaker powers of the scholar.

To be sure many a scholar may turn with pleasure to the home task which has been assigned him. But consider that in the case of the average man even strong interests can stand only a certain degree of daily burdening. If these interests are overstimulated, the danger grows that they will be dulled, yes, killed, even as in the case of overstrained bodily powers. On the other hand every athlete knows that a hard set of exercises, after some days of rest, succeeds with a surprisingly greater exactness. The same thing is true in the mental realm. Meumann's fine experimental investigation of the psychology of the phenomena of practice makes it clear that complete success in developing psycho-physical activity through practice is not gained if the exercise is repeated too frequently.² At all events an interest which has not become surfeited at home will be much more active and lively in the school. For this reason Berthold Otto,³ for months at a time, absolutely forbade his scholars, in the subjects which he teaches, to take work home. Long ago the able pedagogue Ratke (1571-1634) made the same demand, namely, that all the work "should fall upon the schoolmaster."

But now let us take the far more frequent case, that of the scholar who has no strength remaining with which to master the subjects from which the home work is taken, or at least no more strength remaining after the burden of the school hours. As no direct interest binds him to those tasks, they become for him an unpleasant exertion of will power. This is the harder for him, the more he feels the sacrifice of having to deny himself in his free hours to more agreeable employment.

Work under such circumstances is especially hard and especially unproductive. We know what a hindrance the feel-

² *A. A. O.*, pp. 195-216, 17.

³ Berthold Otto, *Concerning the Royal Office of the Parents*.

ing of the unpleasant or disagreeable is to all activities.⁴ Such work wearies in the highest possible degree, since the scholar, after the intense effort of instruction, plainly has need of recreation.

Add to this that the procedure of burdening the scholar with home work affects gifted and weak pupils very differently. While the former can perhaps accomplish the task assigned without suffering the injury of overwork, the latter must use two- and threefold the pains and efforts of the former to accomplish the same task. Thus a greater danger to their health threatens them along with the disadvantage under which they work, on account of their deficiency.

These weighty reasons lead us to regard compulsory home work as a much less wholesome means of education than it was formerly held to be. Among German teachers the following opinion is more and more gaining ground: That that teacher is the best whose discipline requires the least punishment and whose manner of teaching requires the least home exertion on the part of the scholars.⁵ In fact a skilful pedagogue can so direct the instruction that he will develop at the same time with the scholars' ability to grasp and understand their capacity for application, and will keep it in continual practice.

The necessity under which the scholars stand of impressing upon their minds a great deal of material that must be memorized by especial effort, has not yet been avoided. The learning of the lesson must still burden their leisure hours; questioning or examination upon this material must burden the hour of instruction. There seems little hope, indeed, of adjusting the two opposing interests, namely, the didactic demand for putting that kind of study work over into the scholar's free time, and the hygienic veto of such a transfer.

Nevertheless, the way of adjustment lies near at hand. It presents itself directly if we turn our attention to the intervals

⁴ Ebert and Meumann, *A. A. P.*, p. 202-7; *Sag. A. A. O.*, p. 124.

⁵ In the higher schools of Germany the experiment is now being tried of excusing from home work in other subjects those of the highest class who desire to work on independently in some one subject. This too is an admission that respect for compulsory home work has declined.

between school hours. These pauses—five minutes four times, and fifteen minutes once a day—are much too short. A pause of five minutes is not enough to bring about the relative recovery and refreshment which the pupil needs in order to pass from one subject of study to the next. The academic interval of fifteen minutes between all lectures, which has proved itself so excellent in the universities, is much more suitable. On this point, the didactic interests which lays stress upon the scholar's freshened capacity to receive, and the hygienic interest, which commands us not to let the effect of fatigue increase too much through lengthening the time, unite. The school of the future will have only four periods of instruction in the morning, and between every two of these, an interval of fifteen minutes.⁶ The three-quarters of an hour which is lost to us through such a shortening of the length of recitations, we add again to the afternoon hours. We insert it as a special instruction period, which will come in the time when the energy is strong, between 4:00 and 6:00, or 5:00 and 7:00, and takes its place besides the other lesson which we had thought to transfer thither. This supplementary hour must of course belong to the subjects from which time has been taken.

Two observations prepare the way for this plan. First, there is an *art* of studying which can be taught; and the teaching of it arouses an interest in mechanical learning itself, which once awakened lessens progressively the work of learning and makes studying more and more of a success. The particulars concerning it belong in a later article.

The other fact has been brought out by the experimental investigations of the work of the *class*. The attention of the class possesses a greater restraining power against interruptions; it is better able to shut the consciousness against the penetration of foreign attraction than can happen in the case of the work of the "isolated" scholar. Is it true that attention itself in a place where the assembling of many people involves unavoidable noise, is of itself armed with more intense restraint against threatening interruption? Is it true that the sight of the

⁶The experiment of having intervals of this length is now being tried in some of the schools of the Kingdom of Saxony.

attention paid by all the others acts suggestively on each individual? We know, indeed, how speaking in chorus rouses a sleepy class; even epileptic children, who at home oppose the words of their parents, in an institution learn to obey without contradiction the stroke of the bell, to write exercises, to commit to memory, to eat and to submit like normal children.⁷ In short, working in class is worth more and advances more rapidly than work at home. It is the old experience of the social nature of man, the fact known of old which is always confirmed anew in the workshop of every shoemaker and tailor, in every mine, or in any other industrial work, in every government department in every mercantile house: that on the average the work which men do in common is best done.

The school should not neglect such experiences. Better a common-school hour longer in the afternoon, making use of a favorable period of psychical energy (5:00 to 6:00 in the afternoon) devoted exclusively to mechanical learning or in the case of the older scholars to elocution and composition as well, than that constraint of home work which sins in an incalculable and uncontrollable way against the children's need of recreation! The "free" afternoon is a lie if the school takes again from its pupils ten times over the benefit of the freedom which it gives to them with seeming kindness. I am thinking of *special study hours*. Teachers of language, of history, of geography, and of science justly feel that it would be too great a drag on their advancing instruction if this instruction had also to impress with necessary firmness upon the pupils the mechanical material which they need. But it would be more than a mere expedient to bring together all the material to be memorized in each subject in one special hour of the afternoon. The directing teacher in systematic agreement with his colleagues, would have to have the material studied, partly with, partly after, and partly in advance of, the class. Above all he would have to transform the lesson, the study hour, into an art of study, that is, to awake, nourish, and raise into fruitful activity the interest of the scholar in mechanical learning itself, in the manner suggested above.

⁷ See Baesh, *Pädagogik*.

It is the egg of Columbus. It is self-evident, indeed, that this special study period does not need to be a new hour, which would only lengthen the time of instruction. We appropriate for it just that three-quarters of an hour which we had to cut off from the morning instruction in order to gain longer intervals between classes, and which, as unoccupied, we had transferred to the afternoon. If, as we propose here, the study hour takes charge of imprinting on the mind the mechanical material, the teaching hours proper will be relieved from the business of memorizing and repetition, and so it will first be possible to shorten them without deducting anything from the scientific work.

In brief, this arrangement would meet at once all points of view: the technical, that the scholar master his material to be memorized with special care; the hygienic, that to accomplish this the time in which the school busies its pupils must not be at all lengthened by home work; the other hygienic point of view, that of gaining longer intervals between classes; and the scientific, that the intensiveness of the study must not be allowed to suffer. The time which we take away from the hour of teaching in order to shorten it for the sake of the interval, is given back to each subject in the study hour, and indeed is given in a more rational form. Thus from a mathematical standpoint, the whole matter amounts to balancing the parts somewhat differently; the teaching is separated from the studying and the entire time of instruction distributed better on the energy curve of the day.

It is not enough that we release the scholar from homework and afford him fifteen minutes grace by the lengthened interval between classes. We must see to it also that he uses the interval for refreshment and recovery. The question forces itself upon us how these intervals are to be employed. On no account so that by the mode of filling up the time the very purpose for which they are designed, of giving recreation to the scholars, again be made illusory. That will happen if the children romp, jump, and wrestle. The experiments of Mosso have proved that bodily strain which is superimposed on a condition of mental weariness, gives no recreation, but increases the weariness.

Moreover, the passion with which boys and girls give themselves up to noisy play works in a manner that is detrimental to a mental condition of preparation for the instruction to follow.

Of course after the children have sat still in the lesson hour they feel the need of moving, and feel it strongly. But the form which strains and distracts must be avoided. What the body needs is the increased inhalation of oxygen, so that the toxine which the preceding weariness has created will be disintegrated. This stimulation of the circulation of the blood comes through light and temperate movement. Meumann found in experimenting on himself, that short walks of about half an hour could restore the initial capacity for work, even after a considerable fatigue. On this account a quarter of an hour interval between the hours of instruction promises to become an excellent arrangement, as soon as the scholars, instead of romping about, have the benefit of the fresh air only through quiet, restful movement. Even now it is so managed, at least in the fifteen-minute interval, that the scholars, in natural groups, walk in the court of the school under the care of a teacher. Would that our schools might maintain such walks between all successive school periods!

This is the basis for another question which is now much discussed, and which points out to us new pedagogical paths. If after the hour of instruction a stay in the open air can regenerate the blood, and free it from the material fatigue, then, if the instruction takes place near or in the fresh air, the fatigue will not from the very start rise to such a high degree. That is, teaching should be done as often as practicable with open windows, yes, in the open air. A. Schutz in particular, following Stoy's example, has recently made this pedagogical demand. Many a sensible schoolman is striving at the present time to realize it as far as possible. A relative of mine, Dr. Sebald Schwarz, Director of an industrial school in Lübeck, in the summer of 1906, had his boys out of doors for ninety class hours, and this did not take into account frequent afternoon walks.⁸ The plan of making the walks of the scholars a part of the

⁸ Cf. Dr. Sebald Schwarz, *Unsere Schülerreisen*; published by J. Harder, Altona.

instruction as the inquiries of Dr. Schwarz among 140 schools has proved, is still found much too rarely.

The demand for instruction out in the open goes back to Rousseau. It is supported at first not by hygienic but by didactic reasons. In fact it is consistently developed from the principle of observation. But how little does observation amount to if it is only from a book, a chart or a wall map, from stuffed skins of animals, or from wilted or dried mummies of plants, that the scholar learns the life of man, of animal, and plant which pulsates out of doors! How different is the effect when the teacher is allowed to take his scholars out of doors and say, What you learn in geography looks like this, the history of our people lives on in this way or that in what surrounds you daily; so germinate, bloom, and die the plants in wood and field and meadow; this is the way the worm and beetle, the bees and the butterflies move; this is how the birds fly, and this is how the footprints of wild beasts look. Or teacher and pupils look together upon the majesty of the starry heavens, and the teacher paints before the mind's eye of the pupils the genesis and origin of all the twinkling tiny points, which in reality are suns mighty and distant.

By such instruction, which naturally is not possible in all subjects, the attention is fixed; the imagination and fancy are animated. But, further, under these conditions the influence of the teacher gains more intimate and permanent access to the heart—the disposition and emotional nature—of the scholar, and this is the other didactic reason for taking walks with pupils. Let him believe it who will, that the heart and disposition can be formed *ad hoc* by narrow subjects of instruction. They can be developed only by cultivating the two roots of sentiment and disposition. These roots are nature and man's social life. But the former is excluded from the schoolroom, and society between teacher and taught is limited to a mere interchange through instruction. There is no real common life such as is found in the family. But it is only a community of life which can bring about intimate and all-sided contact of the ripe with the nascent man; it is only such contact that sets free by suggestion the

powers of the man in the making until he, too, becomes fully developed on all sides.

We have then the two influences—contact with nature, and more intimate contact with the personality of the teacher—uniting in their effect upon the heart of the scholar if instruction ventures more than heretofore into the open air, and if such society as is possible in instruction enlarges to become a society growing out of common walks and tours.

Moreover, such walking tours, thought of as parts of instruction, train the will of the scholar to more active virtues than that of passive sitting still. We have indicated already how effectively they make new horizons for the mind at the same time with the new horizon of the eye. In sum, the transferring as often as practicable of the instruction into the open air offers the suitable form to bring the old didactic demand of Rousseau—active contemplation of nature in pedagogical community of life between teacher and scholar—to greater honor in the sphere of the school. At the same time that thought of modern hygiene is satisfied which sees in the nervous strength of the scholar national capital, that must be developed as much as possible, and yet conserved with prudence as far as our progressive insight into fatigue, fatigue effects, and fatigue lessening in any way suggests. Once again the demands of far-seeing educational theory and of prudent hygiene stand side by side.

Does not all this mean that too much attention is paid to the scholars? It does no harm, it has often been urged, for boys to get thoroughly tired. Fatigue is the natural result of hard work. A child must learn to exert and apply himself mentally or else his will will not be disciplined. The experimental pedagogue, however, condemns the giving of lessons to children to take home with them. He wishes to transfer the instruction, as far as the weather and the subjects to be taught will allow, into the open air, to the walking tours, into the garden. The first proposal means loafing half the time; the second, loafing all the time. Where in this scheme are earnestness and industry? Where is the consciousness that not one's own enjoyment and caprice, but rather work and activity, determine the worth of

life? To awaken self-mastery and the feeling of responsibility in the scholar is just the business of education. The method presented above would kill both.

Objections such as these only show that human nature is judged all too pessimistically. It is clear that the six hours of which the school daily robs the children for its own purposes give ample opportunity to develop in them the virtues of industry and diligence. What a work of patience every scholar performs who, separated from the joys of the playground, interests himself and lets himself be interested in things which at first lie far outside the course of his spontaneous impulse to action. What discipline in attention already lies in this that, in the teaching hour the pupils must follow continuously the train of thought of the teacher, but must restrain their own associations, the impulses of their own wills! And finally the study hour, or to the maturer scholars, the practice hour, offers opportunity enough for the development of their industry. If we distrust the result obtained during the six school hours, it is hard to see just why more work at home by fatigued scholars should accomplish that miracle of training the will, which a mental discipline of six hours did not achieve.

On the other hand, how optimistically and lightly those dogmatic advocates of will-gymnastics overlook the injury with which every increase in the effects of uncompensated fatigue menaces the health of the school child! It is a good thing that we have learned to demonstrate these effects experimentally, and that we possess statistical data concerning the army of school diseases, the result of unadjusted and uncompensated waste of energy. Measure and number make a greater impression than the bare recording of facts, they sharpen the conscience. As it is a matter of course for us at the present time to provide good chairs in the classroom, which protect the scholars' spines, and good desks which protect their eyes, it is equally self-evident that we should not overstrain their nervous strength, that we should not misuse the school, the means of mental formation and education of our youth, to mistrain and deform their bodily life.

The child, as we have already mentioned, has no part in the

school legislation. He endures it even where it is faulty, and cannot defend himself except by becoming sick. He is given over into the power of adults who usurp the right to educate. Would that the adults might bear in mind the limits of that right with which they undertake the education of the children, so that it may not become a right of force! And would that they might reflect on the foundation of that right, would that they might raise Kant's critical question, "*Quid juris?*" in connection with education! Does it not seem like oppressing children simply to send them to school and rob them many hours a day of their freedom? That the more capable are compelled to sit together with the less gifted and by this means are kept back in their development until the less capable have also hobbled after? To give a wise answer to such questions might well dampen the zeal of those educational tyrants who see in our youth the passive material for pedagogical theories rather than for humane consideration.